Acer Desktop

SMBIOS Specification



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# Revision History

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| --- | --- | --- | --- |
| Version | Release Date | Change Description | Author |
| 0.9 | 03/19/2008 | 1. First release | David Chien |
| 1.0 | 03/21/2008 | 1. Official release 2. Added SMBIOS structure access interface requirements | David Chien |
| 1.1 | 08/12/2008 | 1. Added new requirements for type 1, type 2 and type 3 | David Chien |
| 1.2 | 08/15/2008 | 1. Corrected manufacturer name “Emachines” to “eMachines” for type 1, type 2 and type 3 | David Chien |
| 1.3 | 11/10/2008 | 1. Phased in SMBIOS Reference Specification v2.6 2. Updated type 0, type 4, type 9, type 16 and type 17 requirements 3. Added type 41 Onboard Devices Extended Information | David Chien |
| 1.31 | 12/12/2008 | 1. Updated type 0 requirement for commercial projects | David Chien |
| 1.32 | 03/26/2009 | 1. Modified BIOS information requirements for type 0 2. Added Family string requirements for type 1 | David Chien |
| 1.33 | 05/08/2009 | 1. Phased in SMBIOS Reference Specification v2.6.1 2. Updated type 9 requirements for PCIe Gen 2 3. Updated type 17 requirements for DDR3 | Josh Jong |
| 1.4 | 06/16/2011 | 1. Phased in SMBIOS Reference Specification v2.7.0 2. Updated type 0, type 1, type 2, type 3, type 4, type 9, type 16, type 17, type 19, type 20, requirements 3. Added type 42 Management Controller Host Interface 4. Added supported OS : Windows 7 5. Reserved with 22 space characters for SKU Number in the type 1 6. Reserved 32 with space characters for Location in Chassis in the type 2 7. Reserved with 22 space characters for SKU Number in the type 3 | Yansan Tsai |
| 1.41 | 01/10/2012 | 1. Added type AC for new feature support | Yansan Tsai |
| 1.42 | 02/01/2012 | 1. Modified type AC with new definition | Yansan Tsai |
| 1.43 | 03/15/2012 | 1. Phased in SMBIOS Reference Specification v2.7.1 2. Modified type 1, 2, 3 for motherboard/system swap/consumption requirements 3. Added type 4 offset 10h for new OS requirement 4. Added supported OS : Windows 8 | Yansan Tsai |
| 1.44 | 03/29/2012 | 1. Modified Always connect value for LAN | Yansan Tsai |
| 1.5 | 05/30/2012 | 1. Modified typo (section 2.1) 2. Modified type 0, added BIOS version rule for Windows8 x64 native UEFI supported (section 2.2.1) 3. Modified type 1, added more requirements 4. Modified type 2, added more requirements | Yansan Tsai |
| 1.6 | 10/15/2014 | 1. Phased in SMBIOS Reference Specification v2.8 2. Updated type 0, type 1, type 9, type 17, type 130, type 131 and type ACh requirements. Note: Referred to Intel Management Engine 11 BIOS Spec for type 130 and type 131 3. Removed type 129 4. Removed legacy service functions (SMBIOS 16-bit service function) from chapter 3 5. Modified OS support list in chapter 3 | David Chien |
| 1.7 | 03/31/2015 | 1. Updated type 1, SKU Number definition 2. Updated type ACh requirements 3. Added type ADh Acer OneBIOS Information | David Chien |

|  |  |  |  |
| --- | --- | --- | --- |
| 1.8 | 06/16/2015 | 1. Updated type 1, UUID format 2. Updated type 1, SKU Number definition | David Chien |
| 1.9 | 08/24/2015 | 1. Updated type 1, SKU Number definition | David Chien |
| 2.0 | 10/28/2015 | 1. Phased in SMBIOS Reference Specification v3.0 2. Added type FFh for Realtek DASH support 3. Changed type 26, type 27, type 28 and type 29 to be required for Realtek DASH support 4. Changed type 35 and type 36 to be required for Realtek DASH support 5. Updated type 4, type 11 and type 17 requirements | David Chien |
| 2.1 | 02/02/2016 | 1. Added type F8h for Qualcomm WLAN support 2. Modified default string for type 1, SKU Number | David Chien |
| 2.2 | 07/14/2016 | 1. Modified type 1, Family string definition for Microsoft MDA 2. Modified type 2, base board product name for Intel Kaby Lake refresh project | David Chien |
| 2.3 | 09/01/2016 | 1. Withdrew SKU Number string spec and changed default string to be “0000000000000000” for commercial projects 2. Added “Revo Base” into Family string definition table | David Chien |
| 2.4 | 01/09/2017 | 1. Phased in SMBIOS Reference Specification v3.1 2. Modified type 3, defined new chassis types Mini PC and Stick PC 3. Modified type 7, extended to support cache sizes > 2047MB 4. Added type 43h for TPM device | David Chien |
| 2.5 | 02/21/2017 | 1. Modified type 1, added “Veriton Tax” and “Nitro G” into Family string 2. Added new string into type 11 for Wi-Fi configuration 3. Changed type F8h to be required and modified description 4. Attached Qualcomm “Single SKU Design SMBIOS Approach” Rev. D into type F8h 5. Added Appendix A and attached Acer SMBIOS Table Checklist v1.4 to replace the table checklist in the BIOS phase-in checklist | David Chien |
| 2.6 | 03/23/2017 | 1. Modified type 1, added “Aspire S” and “Revo Cube” into Family string 2. Modified type 11, changed default string to be for US 3. Modified type F8h, set default values to be for US 4. Attached Acer SMBIOS Table Checklist v1.5 in Appendix A | David Chien |
| 2.7 | 08/24/2017 | 1. Modified type 1, added “Veriton S”, “Veriton Essential” and “Predator P” into Family string 2. Removed DOS support from chapter 3 3. Attached Acer SMBIOS Table Checklist v1.6 in Appendix A | David Chien |
| 2.8 | 01/04/2018 | 1. Modified type 0, type 1 and type 2 to meet Windows 10 RS4 requirements 2. Modified type 1, changed “Predator P” to “Predator Orion” and added “Nitro N” into Family string 3. Attached Acer SMBIOS Table Checklist v1.7 in Appendix A | David Chien |
| 2.9 | 01/03/2019 | 1. Phased in SMBIOS Reference Specification v3.2 2. Modified type 1, added “Aspire P”, “Predator X” and “Nitro NS” into Family string 3. Modified type 17, clarified the description for Speed and Configured Memory Speed 4. Attached Acer SMBIOS Table Checklist v1.8 in Appendix A | David Chien |

# 1 Introduction

This document defines Acer’s SMBIOS requirements for Acer desktop product line. As SMBIOS is the most important source of information of a product and the included components, the standardization of Acer’s SMBIOS will help to facilitate the specification and development of the system BIOS and feature software, to standardize manufacturing and technical support processes. The purpose of this document is to have enough information for the vendors and suppliers to develop and to test SMBIOS, feature software, manufacturing and technical support tools for Acer products.

# 2 Acer SMBIOS Requirements

## 2.1 Acer SMBIOS General Requirements

This section summarizes the Acer SMBIOS general requirements:

* It is strongly recommended that the “Handle” of each structure takes the form of “TTSS”
* “TT” is the same as the “Type” of the structure
* “SS” is the sequential number 0, 1, … within the type
  + - For example, the handles for L1 cache and L2 cache structures will be 0700h, 0701h respectively
* Those fields not specifically mentioned in the “Required”, and “Optional” structures should, by default, follow the **SMBIOS Reference Specification v3.2**.

## 2.2 Acer SMBIOS Specific Requirements

The Acer specific requirements of each SMBIOS structures are listed as the following.

### 2.2.1 Type 0: BIOS Information (Required)

* Acer Desktop has specific requirement about the “BIOS Version”
  + EVT stage: E01, E02, E03, …
  + DVT stage: D01, D02, D03, ...
  + MP BIOS: R01-A0 ~ R01-A4; R01-B0 ~ R01-B4; R01-C0 ~ R01-C4; …

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Vendor | STRING | “American Megatrends Inc.”, “Insyde” or “Phoenix” for consumer projects  “Acer”, “Gateway”, “Packard Bell” or “Founder” for commercial projects and the BIOS vendor should be the same as system manufacturer |
| 05h | BIOS Version | STRING | EVT BIOS: starts from E01  DVT BIOS: starts from D01  MP BIOS: starts from R01-A0  This field cannot be modified by SMBIOS tool |
| 08h | BIOS Release Date | STRING | "mm/dd/yyyy"  This field cannot be modified by SMBIOS tool |
| 0Ah | BIOS Characteristics | Bit Field | Defines with functions the BIOS supports  Refer to SMBIOS spec, section 7.1.1 |
| 12h | BIOS Characteristics Extension Bytes | Bit Field | Optional space reserved for future supported functions  Refer to SMBIOS spec, section 7.1.2 |
| 14h | BIOS Major Release Version | Varies | Identifies the major release of the System BIOS |
| 15h | BIOS Minor Release Version | Varies | Identifies the minor release of the System BIOS |
| 16h | Embedded Controller Major Release Version | Varies | Identifies the major release of the embedded controller firmware |
| 17h | Embedded Controller Minor Release Version | Varies | Identifies the minor release of the embedded controller firmware |

### 2.2.2 Type 1: System Information (Required)

* The information in this structure defines attributes of the overall system and is intended to be associated with the Component ID group the system’s MIF.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Manufacturer (Brand Name) | STRING | "Acer", “Gateway”, “Packard Bell” or “Founder”  The manufacturer name in this field is allowed to be modified by SMBIOS tool  The system vendor has to update it during manufacturing if one motherboard is used for multiple brands, also for motherboard swap/consumption  The manufacturer name should be kept when update new BIOS |
| 05h | Product Name | STRING | Defined by project POR  The system product name in this field is allowed to be modified by SMBIOS tool  The system vendor has to update it during manufacturing if one motherboard is used for multiple brands, also for motherboard swap/consumption  The system product name should be kept when update new BIOS |
| 06h | Version | STRING | Reserved with 8 space characters  The system version in this field is allowed to be modified by SMBIOS tool  The system version should be kept when update new BIOS  Fill “1.0” by SMBIOS tool for mass production |
| 07h | Serial Number | STRING | Reserved with 22 space characters  The system serial number in this field is allowed to be modified by SMBIOS tool  The system vendor has to update it during manufacturing if one motherboard is used for multiple brands, also for motherboard swap/consumption  The system serial number should be kept when update new BIOS |
| 08h | UUID | Varies | The value is all FFh as defaults when building BIOS  The UUID value in this field is allowed to be modified by SMBIOS tool  Format: Onboard LAN MAC + date code + reserved values Ex, “AA BB CC DD EE FF” + “YYYY MM DD HH MM SS” + “00 00 00”  The system vendor has to update it during manufacturing if one motherboard is used for multiple brands, also for motherboard swap/consumption  The UUID value should be kept when update new BIOS  Refer to SMBIOS spec, section 7.2.1 |
| 18h | Wake-up Type | ENUM | 00h: Reserved  01h: Other  02h: Unknown  03h: APM Timer  04h: Modem Ring  05h: LAN Remote  06h: Power Switch  07h: PCI PME#  08h: AC Power Restored  Refer to SMBIOS spec, section 7.2.2 |
| 19h | SKU Number | STRING | Reserved with 16 characters and default string is “0000000000000000” for commercial projects  “0000000000000000” for consumer projects  The sku number in this field is allowed to be modified by SMBIOS tool  The system vendor has to update it during manufacturing if one motherboard is used for multiple brands, also for motherboard swap/consumption  The sku number should be kept when update new BIOS |
| 1Ah | Family | STRING | To meet Microsoft 2017 MDA, the Family String should be the product sub-brand name, refer to Family String definition table for the details  The family string in this field is allowed to be modified by SMBIOS tool  The system vendor has to update it during manufacturing  The family string should be kept when update new BIOS |

* Family String definition

|  |  |  |  |
| --- | --- | --- | --- |
| **Microsoft MDA** | **Project** | **Brand** | **Family String** |
| 2016 | Worldwide Commercial | Acer | Acer Desktop |
| China Commercial | Acer | Acer Desktop |
| Founder | Founder Desktop |
| Worldwide Consumer | Acer | Acer Desktop |
| Packard Bell | Packard Bell Desktop |
| Gateway | Gateway Desktop |
| 2017 or later | Worldwide Commercial | Acer | Veriton M |
| Veriton X |
| Veriton N |
| Veriton Z |
| Veriton F |
| Veriton S |
| Veriton Essential |
| Extensa M |
| Extensa X |
| China Commercial | Acer | Veriton T |
| Veriton D |
| Veriton E |
| Veriton B |
| Veriton C |
| Veriton A |
| Veriton Tax |
| Shangqi N |
| Shangqi V |
| Shangqi X |
| Shangqi A |
| Founder | Wenxiang D |
| Wenxiang E |
| Wenxiang A |
| Shangqi N |
| Shangqi Tax |
| Worldwide Consumer | Acer | Aspire U |
| Aspire Z |
| Aspire C |
| Aspire G |
| Aspire X |
| Aspire T |
| Aspire S |
| Aspire P |
| Predator G |
| Predator Orion |
| Predator X |
| Revo One |
| Revo Build |
| Revo Base |
| Revo Cube |
| Nitro G |
| Nitro N |
| Nitro NS |
| Packard Bell | iMedia S |
| oneTwo S |
| Gateway | Gateway |

### 2.2.3 Type 2: Base Board Information (Required)

* The information in this structure defines attributes of a system baseboard.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Manufacturer (Brand Name) | STRING | "Acer", “Gateway”, “Packard Bell” or “Founder”  The manufacturer name in this field is allowed to be modified by SMBIOS tool  The system vendor has to update it during manufacturing if one motherboard is used for multiple brands, also for motherboard swap/consumption  The manufacturer name should be kept when update new BIOS |
| 05h | Product Name | STRING | Defined by project POR  To differentiate Kaby Lake refresh project from Skylake project, add a postfix “(KBL)” for Kaby Lake refresh project  Fox example, Veriton M6640G(KBL)  The base board product name in this field is allowed to be modified by SMBIOS tool  The system vendor has to update it during manufacturing if one motherboard is used for multiple brands, also for motherboard swap/consumption  The base board product name should be kept when update new BIOS |
| 06h | Version | STRING | Reserved with 8 space characters  The base board version in this field is allowed to be modified by SMBIOS tool  The base board version should be kept when update new BIOS  Fill “1.0” by SMBIOS tool for mass production |
| 07h | Serial Number | STRING | Reserved with 22 space characters  The base board serial number in this field is allowed to be modified by SMBIOS tool  The motherboard vendor has to update it during manufacturing  The base board serial number should be kept when update new BIOS |
| 08h | Asset Tag | STRING | Reserved with 22 space characters  The asset tag number in this field is allowed to be modified by SMBIOS tool  The asset tag number should be kept when update new BIOS |
| 0Ah | Location in Chassis | STRING | Reserved with 32 space characters |
| 0Dh | Board Type | ENUM | 0Ah: Motherboard  Refer to SMBIOS spec, section 7.3.2 |

### 2.2.4 Type 3: System Enclosure or Chassis (Required)

* The information in this structure defines attributes of the system’s mechanical enclosure(s).

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Manufacturer (Brand Name) | STRING | "Acer", “Gateway”, “Packard Bell” or “Founder”  The manufacturer name in this field is allowed to be modified by SMBIOS tool  The system vendor has to update it during manufacturing if one motherboard is used for multiple brands, also for motherboard swap/consumption  The manufacturer name should be kept when update new BIOS |
| 05h | Type | Varies | Bit 7 = 1/0 – Chassis is locked/unlocked (for commercial projects)  0 – System without chassis lock (for consumer projects)  Bits 6:0 System enclosure or chassis types  03h: Desktop  0Dh: All in One  23h: Mini PC (volume is <1 liter)  24h: Stick PC (volume is ≤ 0.1 liter)  Refer to SMBIOS spec, section 7.4.1 |
| 06h | Version | STRING | Reserved with 8 space characters |
| 07h | Serial Number | STRING | Reserved with 22 space characters  The chassis serial number in this field is allowed to be modified by SMBIOS tool  The chassis serial number should be kept when update new BIOS |
| 08h | Asset Tag Number | STRING | Reserved with 22 space characters  The asset tag number in this field is allowed to be modified by SMBIOS tool  The asset tag number should be kept when update new BIOS |
| 15h +  n\*m | SKU Number | STRING | Reserved with 22 space characters |

### 2.2.5 Type 4: Processor Information (Required)

* The information in this structure defines the attributes of a single processor; a separate structure instance is provided for each system processor socket/slot.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 05h | Processor Type | ENUM | Refer to SMBIOS spec, section 7.5.1 |
| 06h | Processor Family | ENUM | Writes value 01h (Other) in this field if can’t find proper processor family  Writes value FEh in this field to indicate that obtain the processor family from the Processor Family 2 field (Offset 28h)  Refer to SMBIOS spec, section 7.5.2 |
| 07h | Processor Manufacturer | STRING | “Intel” or “AMD” |
| 10h | Processor  Version | STRING | String number describing the Processor |
| 11h | Voltage | Varies | Bit 7 = 1  Bits 6:0 The processor’s current voltage times 10  For example, 1.2V = 1.2 x 10 = 12 = 0Ch |
| 12h | External Clock | Varies | External clock frequency, in MHz |
| 14h | Max Speed | Varies | Maximum processor speed, in MHz  Notes: The field identifies a capability for the system, not the processor itself |
| 16h | Current Speed | Varies | Same format as Max Speed |
| 19h | Processor Upgrade | ENUM | Writes value 01h (Other) in this field if can’t find proper processor upgrade  Refer to SMBIOS spec, section 7.5.5 |
| 23h | Core Count | Varies | Number of cores per processor socket  For core counts of 256 or greater, the Core Count field is set to FFh and the Core Count 2 field is set to the number of cores |
| 24h | Core Enabled | Varies | Number of enabled cores per processor socket  For core counts of 256 or greater, the Core Enabled field is set to FFh and the Core Enabled 2 field is set to the number of enabled cores |
| 25h | Thread Count | Varies | Number of threads per processor socket  For thread counts of 256 or greater, the Thread Count field is set to FFh and the Thread Count 2 field is set to the number of threads |
| 26h | Processor  Characteristics | Bit Field | Bit 2 = 1 – Processor is 64-bit Capable  0 – Processor is not 64-bit Capable  Refer to SMBIOS spec, section 7.5.9 |
| 28h | Processor Family 2 | ENUM | Refer to SMBIOS spec, section 7.5.2 |
| 2Ah | Core Count 2 | Varies | Number of cores per processor socket  Supports core counts > 255 |
| 2Ch | Core Enabled 2 | Varies | Number of enabled cores per processor socket  Supports core enabled counts > 255 |
| 2Eh | Thread Count 2 | Varies | Number of threads per processor socket  Supports thread counts > 255 |

### 2.2.6 Type 5: Memory Controller Information (Not Required)

### 2.2.7 Type 6: Memory Module Information (Not Required)

### 2.2.8 Type 7: Cache Information (Required)

* The information in this structure defines attributes of CPU cache device in the system.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 05h | Cache Configuration | Varies | Bits 9:8 Operation mode  01b: Write Back  Bits 2:0 Cache level  000b: L1 Cache  001b: L2 Cache  002b: L3 Cache |
| 07h | Maximum Cache Size | Varies | Bit 15 Granularity  0 – 1K granularity  1 – 64K granularity  Bits 14:0 Maximum size in given granularity  Note: The cache size for the different levels of the cache (L1, L2, L3) is the total amount of cache per level per processor socket |
| 09h | Installed Size | Varies | Same format as Maximum Cache Size field |
| 13h | Maximum Cache Size 2 | Bit Field | Bit 31 Granularity  0 – 1K granularity  1 – 64K granularity (always 1b for cache sizes > 2047MB)  Bits 30:0 Max size in given granularity |
| 17h | Installed Cache Size 2 | Bit Field | Same format as Maximum Cache Size 2 field; Absent or set to 0 if no cache is installed |

### 2.2.9 Type 8: Port Connector Information (Optional)

* The information in this structure defines the attributes of a system port connector, for example, parallel, serial, keyboard, or mouse ports. The port’s type and connector information are provided. One structure is present for each port provided by the system.
* Since the “Internal Reference Designator” is not practically used by any tools, it will be actually used for “External Reference Designator”.
* Use easy-to-understand names (all in upper case)  
  For example,
  + PARALLEL
  + SERIAL#
  + KEYBOAD
  + MOUSE
  + USB#
  + 1394
  + VIDEO
  + AUDIO
  + NETWORK

### 2.2.10 Type 9: System Slots (Required)

* The information in this structure defines attributes of a system slot.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Slot Designation | STRING | For example, “PCI#”, “PCIE#” |
| 05h | Slot Type | ENUM | 06h: PCI  A5h: PCI Express  A6h: PCI Express x1  A7h: PCI Express x2  A8h: PCI Express x4  A9h: PCI Express x8  AAh: PCI Express x16  ABh: PCI Express Gen 2  ACh: PCI Express Gen 2 x1  ADh: PCI Express Gen 2 x2  AEh: PCI Express Gen 2 x4  AFh: PCI Express Gen 2 x8  B0h: PCI Express Gen 2 x16  B1h: PCI Express Gen 3  B2h: PCI Express Gen 3 x1  B3h: PCI Express Gen 3 x2  B4h: PCI Express Gen 3 x4  B5h: PCI Express Gen 3 x8  B6h: PCI Express Gen 3 x16  Refer to SMBIOS spec, section 7.10.1 |
| 06h | Slot Data Bus Width | ENUM | 05h: 32 bit (for PCI slot)  08h: 1x or x1 (for PCI Express slot)  09h: 2x or x2 (for PCI Express slot)  0Ah: 4x or x4 (for PCI Express slot)  0Bh: 8x or x8 (for PCI Express slot)  0Ch: 12x or x12 (for PCI Express slot)  0Dh: 16x or x16 (for PCI Express slot)  0Eh: 32x or x32 (for PCI Express slot)  Refer to SMBIOS spec section 7.10.2 |
| 07h | Current Usage | ENUM | 03h: Available  04h: In use |
| 08h | Slot Length | ENUM | 03h: Short length  04h: Long length |
| 0Dh | Segment Group Number | Varies | Refer to SMBIOS spec, section 7.10.8 |
| 0Fh | Bus Number | Varies | Refer to SMBIOS spec, section 7.10.8 |
| 10h | Device/Function Number | Bit Field | Bits 7:3 Device number  Bits 2:0 Function number  Refer to SMBIOS spec, section 7.10.8 |

Note: slot type A5h should be used only for PCI Express slots where the physical width is identical to the electrical width; in that case the “System Slots – Slot Data Bus Width” field specifies the width. Other PCI Express slot types (A6h-AAh, ACh~B0h) should be used to describe slots where the physical width is different from the maximum electrical width; in these cases the width indicated in this field’s refers to the physical width of the slot, while electrical width is described in the “System Slots – Slot Data Bus Width” field.

### 2.2.11 Type 10: On Board Devices Information (Required)

* The information in this structure defines attributes of devices that are onboard (soldered onto) a system element, usually the baseboard.
* There should be a unique structure instance for each onboard device.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Device Type | Varies | Bit 7 = 1 – Device enabled  0 – Device disabled  Bits 6:0 Type of device  03h: Video  05h: Ethernet  07h: Sound  08h: PATA controller  09h: SATA controller |
| 05h | Description String | STRING | For example, “Onboard ATI Graphics”, “Onboard Realtek HD Audio” |

### 2.2.12 Type 11: OEM Strings (Required)

* This structure contains the chipset information of the base board.  
  The 2nd string is required for Intel Unite support

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Count | Varies | 01h for system platform information  02h for Intel Unite support  03h(or 02h if no Intel Unite support) for Wi-Fi configuration support |
| 05h | Description String | STRING | Format: “Chipset Vendor North Bridge + South Bridge”  For example,  “INTEL Q35 + ICH9DO”,  “AMD RS690 + SB600”,  “NVIDIA MCP73”  For Intel Unite support,  “IntelUnite"  For Wi-Fi configuration support,  “Wi-Fi Config for World Wide”,  “Wi-Fi Config for US”,  “Wi-Fi Config for Indonesia” or  “Wi-Fi Config for Egypt”  Default string is for US and the system vendor has to update it during manufacturing according to order request |

### 2.2.13 Type 12: System Configuration Options (Optional)

* This structure contains information required to configure the base board’s Jumpers and Switches.

### 2.2.14 Type 13: BIOS Language Information (Optional)

* The information in this structure defines the installable language attributes of the BIOS.

### 2.2.15 Type 14: Group Associations (Not Required)

### 2.2.16 Type 15: System Event Log (Optional)

* The presence of this structure within the SMBIOS data returned for a system indicates that the system supports an event log.
* The ODM suppliers should implement “memory-mapped physical 32-bit address” for access method.

### 2.2.17 Type 16: Physical Memory Array (Required)

* This structure describes a collection of memory devices that operate together to form a memory address space.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Location | ENUM | 03h: System board or motherboard |
| 05h | Use | ENUM | 03h: System memory |
| 06h | Memory Error Correction | ENUM | 01h: Other  02h: Unknown  03h: None  04h: Parity  05h: Single-bit ECC  06h: Multi-bit ECC  07h: CRC |
| 07h | Maximum Capacity | Varies | The maximum memory capacity, in kilobytes, for this array  If the capacity is not represented in this field, then this field contains 8000 0000h and the Extended Maximum Capacity field should be used. Values 2 TB (8000 0000h) or greater must be represented in the Extended Maximum Capacity field. |
| 0Bh | Memory Error Information Handle | Varies | The handle, or instance number, associated with any error that was previously detected for the array  FFFEh: The system does not provide the error information structure  FFFFh: No error was detected |
| 0Dh | Number of Memory Devices | Varies | The number of slots or sockets available for Memory Devices in this array |
| 0Fh | Extended Maximum Capacity | Varies | The maximum memory capacity, in bytes, for this array. This field is only valid when the Maximum Capacity field contains 80000000h. When Maximum Capacity contains a value which is not 80000000h, Extended Maximum Capacity must contain zeros |

### 2.2.18 Type 17: Memory Device (Required)

* This structure describes a single memory device that is part of a larger Physical Memory Array (Type 16)
* If a system includes memory-device sockets, the SMBIOS implementation includes a Memory Device structure instance for each slot whether or not the socket is currently populated.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Physical Memory Array Handle | Varies | The handle, or instance number, associated with the Physical Memory Array to which this device belongs |
| 06h | Memory Error Information Handle | Varies | The handle, or instance number, associated with any error that was previously detected for the device  FFFEh: The system does not provide the error information structure  FFFFh: No error was detected |
| 08h | Total Width | Varies | The total width, in bits, of this memory device, including any check or error-correction bits |
| 0Ah | Data Width | Varies | The data width, in bits, of this memory device |
| 0Ch | Size | Varies | If the size is 32 GB-1 MB or greater, the field value is 7FFFh and the actual size is stored in the Extended Size field.  The size of the memory device  Bit 15 = 0 – the value is specified in MB units  1 – the value is specified in KB units |
| 0Eh | Form Factor | ENUM | 09h: DIMM  0Dh: SODIMM |
| 0Fh | Device Set | Varies | Identifies when the Memory Device is one of a set of Memory Devices that must be populated with all devices of the same type and size, and the set to which this device belongs |
| 10h | Device Locator | STRING | The string number of the string that identifies the physically labeled socket or board position where the memory device is located  For example, “DIMM#” |
| 11h | Bank Locator | STRING | The string number of the string that identifies the physically labeled bank where the memory device is located  For example, “Bank 0” or “Bank A” |
| 12h | Memory Type | ENUM | 01h: Other,  13h: DDR2  18h: DDR3  1Ah: DDR4  1Dh: LPDDR3  1Eh: LPDDR4 |
| 13h | Type Detail | Bit Field | Bit 7 = 1 – Synchronous |
| 15h | Speed | Varies | Identifies the maximum capable speed of the device, in megatransfers per second (MT/s). If the value is 0, the speed is unknown |
| 17h | Manufacturer | STRING | String number for the manufacturer of this memory device  The system BIOS should get the manufacturer from SPD and write it in this field |
| 18h | Serial Number | STRING | String number for the serial number of this memory device  The system BIOS should get the serial number from SPD and write it in this field |
| 19h | Asset Tag | STRING | String number for the asset tag of this memory device  Reserved with 22 space characters |
| 1Ah | Part Number | STRING | String number for the part number of this memory device  Reserved with 22 space characters |
| 1Bh | Attributes | Varies | Bits 7:4 Reserved  Bits 3:0 Rank |
| 1Ch | Extended size | Varies | The extended size of the memory device (complements the Size field at offset 0Ch)  Refer to SMBIOS spec, section 7.18.4 |
| 20h | Configured Memory ~~Clock~~ Speed | Varies | Identifies the configured speed of the memory device, in megatransfers per second (MT/s). If the value is 0, the speed is unknown |
| 22h | Minimum Voltage | Varies | Minimum operating voltage for this device, in millivolts  If the value is 0, the voltage is unknown |
| 24h | Maximum Voltage | Varies | Maximum operating voltage for this device, in millivolts  If the value is 0, the voltage is unknown |
| 26h | Configured Voltage | Varies | Configured voltage for this device, in millivolts  If the value is 0, the voltage is unknown |

### 2.2.19 Type 18: 32bit Memory Error Information (Not Required)

### 2.2.20 Type 19: Memory Array Mapped Address (Required)

* This structure provides the address mapping for a Physical Memory Array. One structure is present for each contiguous address range described.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Starting Address | Varies | The physical address, in kilobytes, of a range of memory mapped to the specified Physical Memory Array  When the field value is FFFFFFFFh, the actual address is stored in the Extended Starting Address field |
| 08h | Ending Address | Varies | The physical ending address of the last kilobyte of a range of addresses mapped to the specified Physical Memory Array  When the field value is FFFFFFFFh and the Starting Address field also contains FFFFFFFFh, the actual address is stored in the Extended Ending Address field |
| 0Ch | Memory Array Handle | Varies | The handle, or instance number, associated with the Physical Memory Array to which this address range is mapped |
| 0Eh | Partition Width | Varies | Identifies the number of Memory Devices that form a single row of memory for the address partition defined by this structure |
| 0Fh | Extended Starting Address | Varies | The physical address, in bytes, of a range of memory mapped to the specified Physical Memory Array  This field is valid when Starting Address contains the value FFFFFFFFh. If Starting Address contains a value other than FFFFFFFFh, this filed contains zeros |
| 17h | Extended Ending Address | Varies | The physical ending address, in bytes, of the last of a range of addresses mapped to the specified Physical Memory Array  This field is valid when both Starting Address and Ending Address contain the value FFFFFFFFh. If Ending Address contains a value other than FFFFFFFFh, this filed contains zeros |

### 2.2.21 Type 20: Memory Device Mapped Address (Required)

* This structure maps memory address space usually to a device-level granularity. One structure is present for each contiguous address range described.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Starting Address | Varies | The physical address, in kilobytes, of a range of memory mapped to the referenced Memory Device  When the field value is FFFFFFFFh the actual address is stored in the Extended Starting Address field |
| 08h | Ending Address | Varies | The physical ending address of the last kilobyte of a range of addresses mapped to the referenced Memory Device  When the field value is FFFFFFFFh the actual address is stored in the Extended Ending Address field |
| 0Ch | Memory Device Handle | Varies | The handle, or instance number, associated with the Memory Device structure to which this address range is mapped |
| 0Eh | Memory Array Mapped Address Handle | Varies | The handle, or instance number, associated with the Memory Array Mapped Address structure to which this device address range is mapped |
| 13h | Extended Starting Address | Varies | The physical address, in bytes, of a range of memory mapped to the referenced Memory Device  This field is valid when Starting Address contains the value FFFFFFFFh. If Starting Address contains a value other than FFFFFFFFh, this filed contains zeros |
| 1Bh | Extending Ending Address | Varies | The physical ending address, in bytes, of the last of a range of addresses mapped to the referenced Memory Device  This field is valid when both Starting Address and Ending Address contain the value FFFFFFFFh. If Ending Address contains a value other than FFFFFFFFh, this filed contains zeros |

### 2.2.22 Type 21: Built-in Pointing Device (Not Required)

### 2.2.23 Type 22: Portable Battery (Not Required)

### 2.2.24 Type 23: System Reset (Not Required)

### 2.2.25 Type 24: Hardware Security (Required)

* This structure describes the system-wide hardware security settings.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Hardware Security Settings | Bit Field | Bits 7:6 Power-on Password Status  00b: Disabled  01b: Enabled  10b: Not Implemented  11b: Unknown  Bits 5:4 Keyboard Password Status  00b: Disabled  01b: Enabled  10b: Not Implemented  11b: Unknown  Bits 3:2 Administrator Password Status  00b: Disabled  01b: Enabled  10b: Not Implemented  11b: Unknown  Bits 1:0 Front Panel Reset Status  00b: Disabled  01b: Enabled  10b: Not Implemented  11b: Unknown |

### 2.2.26 Type 25: System Power Controls (Not Required)

### 2.2.27 Type 26: Voltage Probe (Required for Realtek DASH)

* This describes the attributes for a voltage probe in the system. Each structure describes a single voltage probe.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Description | STRING | Number of the string that contains additional descriptive information about the probe or its location |
| 05h | Location and Status | Bit-field | Probe’s physical location and status of the voltage monitored by this voltage probe  Refer to SMBIOS spec, section 7.27.1 |
| 06h | Maximum Value | Varies | Maximum voltage level readable by this probe, in millivolts  If the value is unknown, the field is set to 0x8000 |
| 08h | Minimum Value | Varies | Minimum voltage level readable by this probe, in millivolts  If the value is unknown, the field is set to 0x8000 |
| 0Ah | Resolution | Varies | Resolution for the probe’s reading, in tenths of millivolts  If the value is unknown, the field is set to 0x8000 |
| 0Ch | Tolerance | Varies | Tolerance for reading from this probe, in plus/minus millivolts  If the value is unknown, the field is set to 0x8000 |
| 0Eh | Accuracy | Varies | Accuracy for reading from this probe, in plus/minus 1/100th of a percent  If the value is unknown, the field is set to 0x8000 |
| 10h | OEM-defined | Varies | OEM- or BIOS vendor-specific information |
| 14h | Nominal Value | Varies | Nominal value for the probe’s reading in millivolts  If the value is unknown, the field is set to 0x8000  This field is present in the structure only if the structure’s length is larger than 14h |

### 2.2.28 Type 27: Cooling Device (Required for Realtek DASH)

* This structure describes the attributes for a cooling device in the system. Each structure describes a single cooling device.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Temperature Probe Handle | Varies | Handle, or instance number, of the temperature probe (refer to SMBIOS spec, section 7.29) monitoring this cooling device  A value of 0xFFFF indicates that no probe is provided |
| 06h | Device Type and Status | Bit-field | Cooling device type and status  Refer to SMBIOS spec, section 7.28.1 |
| 07h | Cooling Unit Group | Varies | Cooling unit group to which this cooling device is associated |
| 08h | OEM-defined | Varies | OEM- or BIOS vendor-specific information |
| 0Ch | Nominal Speed | Varies | Nominal value for the cooling device’s rotational speed, in revolutions-per-minute (rpm)  If the value is unknown or the cooling device is non-rotating, the field is set to 0x8000  This field is present in the structure only if the structure’s length is larger than 0Ch |
| 0Eh | Description | STRING | Number of the string that contains additional descriptive information about the cooling device or its location  This field is present in the structure only if the structure’s length is 0Fh or larger |

### 2.2.29 Type 28: Temperature Probe (Required for Realtek DASH)

* This structure describes the attributes for a temperature probe in the system. Each structure describes a single temperature probe.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Description | STRING | Number of the string that contains additional descriptive information about the probe or its location |
| 05h | Location and Status | Bit-field | Probe’s physical location and the status of the temperature monitored by this temperature probe  Refer to SMBIOS spec, section 7.29.1 |
| 06h | Maximum Value | Varies | Maximum temperature readable by this probe, in 1/10th degrees C  If the value is unknown, the field is set to 0x8000 |
| 08h | Minimum Value | Varies | Minimum temperature readable by this probe, in 1/10th degrees C  If the value is unknown, the field is set to 0x8000 |
| 0Ah | Resolution | Varies | Resolution for the probe’s reading, in 1/1000th degrees C  If the value is unknown, the field is set to 0x8000 |
| 0Ch | Tolerance | Varies | Tolerance for reading from this probe, in plus/minus 1/10th degrees C  If the value is unknown, the field is set to 0x8000 |
| 0Eh | Accuracy | Varies | Accuracy for reading from this probe, in plus/minus 1/100th of a percent  If the value is unknown, the field is set to 0x8000 |
| 10h | OEM-defined | Varies | OEM- or BIOS vendor-specific information |
| 14h | Nominal Value | Varies | Nominal value for the probe’s reading in 1/10th degrees C  If the value is unknown, the field is set to 0x8000  This field is present in the structure only if the structure’s Length is larger than 14h |

### 2.2.30 Type 29: Electrical Current Probe (Required for Realtek DASH)

* This structure describes the attributes for an electrical current probe in the system. Each structure describes a single electrical current probe.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Description | STRING | Number of the string that contains additional descriptive information about the probe or its location |
| 05h | Location and Status | ENUM | Defines the probe’s physical location and the status of the current monitored by this current probe  Refer to SMBIOS spec, section 7.30.1 |
| 06h | Maximum Value | Varies | Maximum current readable by this probe, in milliamps  If the value is unknown, the field is set to 0x8000 |
| 08h | Minimum Value | Varies | Minimum current readable by this probe, in milliamps  If the value is unknown, the field is set to 0x8000 |
| 0Ah | Resolution | Varies | Resolution for the probe’s reading, in tenths of milliamps  If the value is unknown, the field is set to 0x8000 |
| 0Ch | Tolerance | Varies | Tolerance for reading from this probe, in plus/minus milliamps  If the value is unknown, the field is set to 0x8000 |
| 0Eh | Accuracy | Varies | Accuracy for reading from this probe, in plus/minus 1/100th of a percent  If the value is unknown, the field is set to 0x8000 |
| 10h | OEM-defined | Varies | OEM- or BIOS vendor-specific information |
| 14h | Nominal Value | Varies | Nominal value for the probe’s reading in milliamps  If the value is unknown, the field is set to 0x8000  This field is present in the structure only if the structure’s length is larger than 14h |

### 2.2.31 Type 30: Out-of-Band Remote Access (Not Required)

### 2.2.32 Type 31: BIS Entry Point (Not Required)

### 2.2.33 Type 32: System Boot Information (Required)

* The client system firmware (for example, BIOS) communicates the System Boot Status to the client’s Pre-boot Execution Environment (PXE) boot image or OS-present management application through this structure.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 0Ah | Boot Status | Varies | Refer to SMBIOS spec, section 7.33.1 |

### 2.2.34 Type 33: 64-bit Memory Error Information (Not Required)

### 2.2.35 Type 34: Management Device (Not Required)

### 2.2.36 Type 35: Management Device Component (Required for Realtek DASH)

* This structure associates a cooling device or environmental probe with structures that define the controlling hardware device and (optionally) the component’s thresholds.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Description | STRING | Number of the string that contains additional descriptive information about the component |
| 05h | Management Device Handle | Varies | Handle, or instance number, of the Management Device (refer to Type FFh) that contains this component |
| 07h | Component Handle | Varies | Handle, or instance number, of the probe or cooling device that defines this component  Refer to SMBIOS spec, section 7.27, 7.28, 7.29, and 7.30 |
| 09h | Threshold Handle | Varies | Handle, or instance number, associated with the device thresholds  Refer to SMBIOS spec, section 7.37  A value of 0FFFFh indicates that no Threshold Data structure is associated with this component |

### 2.2.37 Type 36: Management Device Threshold Data (Required for Realtek DASH)

* The information in this structure defines threshold information for a component (probe or cooling-unit) contained within a Management Device.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Lower Threshold – Non-critical | Varies | Lower non-critical threshold for this component |
| 06h | Upper Threshold – Non-critical | Varies | Upper non-critical threshold for this component |
| 08h | Lower Threshold – Critical | Varies | Lower critical threshold for this component |
| 0Ah | Upper Threshold – Critical | Varies | Upper critical threshold for this component |
| 0Ch | Lower Threshold – Non-recoverable | Varies | Lower non-recoverable threshold for this component |
| 0Eh | Upper Threshold – Non-recoverable | Varies | Upper non-recoverable threshold for this component |

### 2.2.38 Type 37: Memory Channel (Not Required)

### 2.2.39 Type 38: IPMI Device Information (Not Required)

### 2.2.40 Type 39: System Power Supply (Not Required)

### 2.2.41 Type 40: Additional Information (Not Required)

### 2.2.42 Type 41: Onboard Devices Extended Information (Required)

* There should be a unique structure instance for each onboard device.
* The ODM suppliers should implement both type 10 and type 41 to allow existing SMBIOS browsers to properly display the system ‘s onboard devices information.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Value** | **Description** |
| 04h | Reference Designation | STRING | For example, “Onboard ATI Graphics”, “Onboard Realtek HD Audio” |
| 05h | Device Type | ENUM | Bit 7 = 1 – Device enabled  0 – Device disabled  Bits 6:0 Type of device  03h: Video  05h: Ethernet  07h: Sound  08h: PATA controller  09h: SATA controller |
| 06h | Device Type Instance | Varies | Refer to SMBIOS spec, section 7.42.3 |
| 07h | Segment Group Number | Varies | Refer to SMBIOS spec, section 7.42.4 |
| 09h | Bus Number | Varies | Refer to SMBIOS spec, section 7.42.4 |
| 0Ah | Device/Function Number | Bit Field | Bits 7:3 Device number  Bits 2:0 Function number  Refer to SMBIOS spec, section 7.42.4 |

### 2.2.43 Type 42: Management Controller Host Interface (Not Required)

### Type 43: TPM Device (Required)

* The system BIOS must implement SMBIOS type 43h structure which includes the TPM device information.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Offset** | **Name** | **Length** | **Value** | **Description** |
| 04h | Vendor ID | 4 BYTES | Varies | Specified as four ASCII characters, as defined by TCG Vendor ID |
| 08h | Major Spec Version | BYTE | Varies | Major TPM version supported by the TPM device. For example, the value is 01h for TPM v1.2 and is 02h for TPM v2.0 |
| 09h | Minor Spec Version | BYTE | Varies | Minor TPM version supported by the TPM device. For example, the value is 02h for TPM v1.2 and is 00h for TPM v2.0 |
| 0Ah | Firmware Version 1 | DWORD | Varies | For Major Spec Version 01h, this field contains the TPM\_VERSION structure defined in the TPM Main Specification, Part 2, Section 5.3  For Major Spec Version 02h, this field contains the most significant 32 bits of a TPM vendor-specific value for firmware version |
| 0Eh | Firmware Version 2 | DWORD | Varies | For Major Spec Version 01h, this field contains 00h  For Major Spec Version 02h, this field contains the least significant 32 bits of a TPM vendor-specific value for firmware version |
| 12h | Description | BYTE | STRING | String number of descriptive information of the TPM device |
| 13h | Characteristics | QWORD | Varies | Bit 0 – Reserved  Bit 1 – Reserved  Bit 2 – TPM Device Characteristics are not supported  Bit 3 – Family configurable via firmware update; for example, switching between TPM 1.2 and TPM 2.0  Bit 4 – Family configurable via platform software support, such as BIOS Setup; for example, switching between TPM 1.2 and TPM 2.0  Bit 5 – Family configurable via OEM proprietary mechanism; for example, switching between TPM 1.2 and TPM 2.0  Bits 63:6 – Reserved |
| 1Bh | OEM-defined | DWORD | Varies | OEM or BIOS vendor-specific information |

### 2.2.45 Type 126: Inactive (Optional)

* This structure definition supports a system implementation where the SMBIOS structure-table is a superset of all supported system attributes and provides a standard mechanism for the system BIOS to signal that a structure is currently inactive and should not be interpreted by the upper-level software.

### 2.2.46 Type 127: End-of-Table (Required)

* This structure type identifies the end of the structure table that might be earlier than the last byte within the buffer specified by the structure.

### 2.2.47 Type 130: Intel AMT-Specific SMBIOS Structure (Required for Intel AMT)

* This structure is to indicate the status of Intel AMT components.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Length** | **Description** |
| 04h | AmtSignature | DWORD | 4 bytes of data  Must have the Intel AMT signature “$AMT” |
| 08h | AmtSupported | BYTE | \*Boolean value  This value is true for an Intel AMT capable machine, and false for a machine with no Intel AMT capabilities |
| 09h | AmtEnabled | BYTE | \*Boolean value  This value is true for an Intel AMT capable machine, where Intel AMT in a working state |
| 0Ah | SRoUEnabled | BYTE | \*Boolean value  This value will be true if Storage Redirection over USBr is enabled |
| 0Bh | SOLEnabled | BYTE | \*Boolean value  This value will be true if Serial Over LAN capability is enabled |
| 0Ch | NetworkEnabled | BYTE | \*Boolean value  This value will be true if the network interface is enabled in the system |
| 0Dh | ExtendedData | BYTE | 0xA5 (for backward compatibility) |
| 0Eh | OEMCapabities1 | BYTE | Bit 0 – Reserved, must be 0x01  Bit 1 – Reserved, must be 0x01  Bit 2 – BIOS reflash supported, if 1b  Bit 3 – BIOS boot into setup screen supported, if 1b  Bit 4 – BIOS pause before booting operating system is supported, if 1b  Bit 5 – BIOS does not support boot from Floppy device, if 1b  Bit 6 – BIOS does not support boot from CD/DVD device, if 1b  Bit 7 – Reserved, must be 0x01 |
| 0Fh | OEMCapabities2 | BYTE | Terminal Emulation - Specify which type of terminal should be used by the remote console when redirecting BIOS screen  0x01 – VT52 (Basic monochrome)  0x02 – VT100+ (Added function keys F5~F14)  0x03 – VT-UTF8  0x04 – PC-ANSI |
| 10h | OEMCapabities3 | BYTE | Bits 6:0 – Reserved, must be 0x00  Bit 7 – BIOS Secure Boot supported, if 1b |
| 11h | OEMCapabities4 | BYTE | Reserved – must be 0x00 |
| 12h | KVMEnabled | BYTE | \*Boolean value  This value will be true if KVM redirection is enabled |
| 13h | Reserved | BYTE | Reserved |

Note: Boolean value has the following definition. 0x0 – NO, 0x1 – Yes, 0x2 and others – N/A; N/A means ignore.

### 2.2.48 Type 131: Intel ME System BIOS Structure (Required for Intel AMT)

* This structure is to specify hardware, firmware and BIOS capabilities of the platform.

|  |  |  |  |
| --- | --- | --- | --- |
| **Offset** | **Name** | **Length** | **Description** |
| 04h | CPU Capability | DWORD | Bit Definitions (1 – enabled, 0 – disabled)  Bit 0 – VMX enabled state (This bit is a duplicate of Bit 5 and maintained for backward compatibility)  Bit 1 – SMX enabled state (This bit is a duplicate of Bit 3 and maintained for backward compatibility)  Bit 2 – TXT capability  Bit 3 – TXT enabled state  Bit 4 – VMX capability  Bit 5 – VMX enabled state  Bit 6 – Reserved  Bit 7 – Reserved  Bits 31:8 – Reserved, must set to “0” |
| 08h | Intel MEBX Version | QWORD | Bits 15:0 – Intel MEBX Version Major  Bits 31:16 – Intel MEBX Version Minor  Bits 47:32 – Intel MEBX Version Hotfix  Bits 63:48 – Intel MEBX Version Build |
| 10h | PCH Capability | QWORD | Bit Description (1 – enabled, 0 – disabled)  Bits 2:0 – PCI Device Function Number  Bits 7:3 – PCI Device Device Number  Bits 15:8 – PCI Device Bus Number  Bits 31:16 – Device Identification Number (DID): this field identify of PCH PCI device. The DID will be set to 0xFF if not found  Bits 63:32 – Reserved, must set to “0x00” |
| 18h | Intel Management Engine Platform Capabilities | 3 DWORD | Bit Description (1 – enabled, 0 – disabled)  Byte 0-3: Intel Management Engine Platform Capabilities  Bit 0 – Intel Management Engine Enabled/Disabled  Bits 2:1 – Reserved, must set to 0  Bit 3 – Intel AMT  Bit 4 – Intel Standard Manageability  Bit 5 – Intel Small Business Advantage  Bits 13:6 – Reserved, must set to 0  Bit 14 – KVM supported  Bit 15 – Local Wakeup Timer supported  Bits 31:16 – Reserved, must set to 0  Byte 4-11: Intel Management Engine FW Version  Bits 47:32 – Intel Management Engine FW Minor Version  Bits 63:48 – Intel Management Engine FW Major Version  Bits 79:64 – Intel Management Engine FW Build Number  Bits 95:80 – Intel Management Engine FW Hotfix Number |
| 24h | Intel Management Engine Platform Configuration State | DWORD | Bits 7:0 – Reserved, must set to “0” |
| 28h | Network Device – LAN | 3 DWORD | Bit Description (1 – enabled, 0 – disabled)  Wired NIC  Bits 2:0 – PCI Device Function Number  Bits 7:3 – PCI Device Device Number  Bits 15:8 – PCI Device Bus Number  Bits 31:16 – PCI Device Identifier (DID) of wired NIC. DID will be set to 0xFF if not found  Bits 47:32 – Wired NIC Reserved  Wireless NIC  Bits 50:48 – PCI Device Function Number  Bits 55:51 – PCI Device Device Number  Bits 63:56 – PCI Device Bus Number  Bits 79:64 – PCI Device Identifier (DID) of wireless NIC. DID will be set to 0xFF if not found  Bits 95:80 – Reserved, must set to 0 |
| 34h | BIOS Security Capabilities | DWORD | Bit Description (1 – enabled, 0 – disabled)  Bit 0 – Reserved, must set to 0  Bit 1 – BIOS supports VT-d in BIOS setup screen (can be editable)  Bit 2 – BIOS supports TXT in BIOS setup screen (can be editable)  Bit 3 – Reserved, must set to 0  Bit 4 – Reserved, must set to 0  Bit 5 – BIOS supports VT-x in BIOS setup screen (can be editable)  Bits 31: 6 – Reserved, must set to “0” |
| 38h | Structure Identifier | DWORD | This field is the unique identifier for Intel vPro specific SMBIOS type 131 structure  Bits 7:0 = 0x76  Bits 15:8 = 0x50  Bits 23:16 = 0x72  Bits 31:24 = 0x6F |
| 3Ch | Reserved | DWORD | Bits 31:0 – Reserved, must set to “0” |

### 2.2.49 Type ACh: Acer WMI Spec Revision and Support (Required)

* The system BIOS must implement SMBIOS type ACh structure which includes the Acer WMI major and minor revision.
* The function information starting from offset 06h is required for project with IOAC support

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Offset** | **Name** | **Length** | **Value** | **Description** |
| 04h | Acer WMI Major Revision | BYTE | Varies | Refer to latest Acer WMI specification |
| 05h | Acer WMI Minor Revision | BYTE | Varies | Refer to latest Acer WMI specification |
| 06h+  3\*(n-1) | Function (n) | BYTE | ENUM | Function supported in BIOS |
| 07h+  3\*(n-1) | Parameter for function (n) | WORD | ENUM | Parameter of function |

* Function definition

|  |  |  |
| --- | --- | --- |
| **Function n** | **Function name** | **Parameter** |
| 01h | Reserved | Reserved |
| 02h | Wireless connection | 01h Generic |
| 02h Instant connect |
| 03h Always connect |
| 03h | Reserved | Reserved |
| 04h | LAN connection | 01h Generic |
| 03h Always connect |
| Others | Reserved | Reserved |

### 2.2.50 Type ADh: Acer OneBIOS Information (Required)

* The system BIOS must implement SMBIOS type ADh structure which includes the Acer OneBIOS information.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Offset** | **Name** | **Length** | **Value** | **Description** |
| 04h | Acer OneBIOS Major Flag | WORD | Varies | Refer to latest Acer DT OneBIOS PES for the details |
| 06h | Acer OneBIOS Minor Flag | WORD | Varies | Refer to latest Acer DT OneBIOS PES for the details |

### 2.2.51 Type F8h: Qualcomm WLAN Configuration Data (Required)

* The system BIOS must implement SMBIOS type F8h structure which includes the Qualcomm WLAN configuration data. It is necessary to write the configuration to SMBIOS. Also, to comply with the regulation, it is necessary not to update the configuration after shipping.  
  During BIOS POST, the system BIOS must get Wi-Fi Config string (string #3 if Intel Unite support or string #2 if no Intel Unite support) from type 11 and then update OEM type F8h with proper value.  
  Default values are for US and if there is no Wi-Fi configuration string found in type 11, keep default values.  
  

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Offset** | **Name** | **Length** | **Value** | **Description** |
| 04h | 11ac Disable | BYTE | Varies | Disable/Enable 11ac  0x00: Enable 11ac  0x01: Disable 11ac  Default: 0x00 |
| 05h | Country Code Flag | BYTE | Varies | 0x00 : Disable Country Code setting from SMBIOS  0x01: Set Country Code by ANSI country name  0x02: Worldwide Regdomain  Default: 0x01 |
| 06h | Country Code Value | WORD | Varies | If country code flag = 0x01,  set country to Unite States, then value = 0x5553(“U” = 0x55, “S” = 0x53),  set country to INDONESIA, then value = 0x4944(“I” = 0x49, “D” = 0x44)  If country code flag = 0x02, value = 0x0060~0x006C(WWR)  Default: 0x5553 |
| 08h | Board Data File Name Extension | BYTE | STRING | Set default value to 0(string is not required) If the configuration in the default board data cannot fulfill with the current requirements, it is necessary to use the different board data file. This field allows the vendor to configure the board data file name extension |

### 2.2.52 Type FFh: Platform Level Data Model Sensor (Required for Realtek DASH)

* The system BIOS must implement SMBIOS type FFh structure which includes the PLDM sensors information.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Offset** | **Name** | **Length** | **Value** | **Description** |
| 04h | Sensor Handle | WORD | Varies | The handler associated with SMBIOS sensor |
| 06h | Flags | WORD | Varies | Bit 0 – PLDM sensor  Bit 1 – ASF legacy sensor  Bit 2 – Legacy sensor  Bits 4:3 PLDM capable controller type  00b: BIOS  01b: MC/EC  10b: IB agent  Bits 15:5 Reserved |
| 08h | PLDM TID | BYTE | Varies | PLDM TID for the sensor |
| 09h | PLDM Sensor ID | BYTE | Varies | PLDM sensor ID |
| 0Ah | PLDM MC Slave Address | BYTE | Varies | PLDM EC slave address  Bit 0 = 1 – Enable PEC  0 – Disable PEC |
| 0Bh | Legacy Sensor Address | BYTE | Varies | SMBus address for legacy sensor |
| 0Ch | Legacy Sensor Register | BYTE | Varies | Register for legacy sensor |
| 0Dh | Sensor Reading Modifier | BYTE | Varies | Reading of the sensor is modified by 10^(X), where X is the value of this byte (signed) |
| 0Eh | Reserved | Varies | Varies | Reserved for future usage |

# 3 SMBIOS Structure Access Interface Requirements

The ODM supplier should provide interfaces for SMBIOS structure access, and these interfaces should support following operating systems.

* EFI Shell (both 32-bit and 64-bit)
* Windows OS (both 32-bit and 64-bit)
* Linux OS (both 32-bit and 64-bit)

# Appendix A Acer SMBIOS Table Checklist

